

Claim Amendments

Claim 1 (previously presented): An apparatus for generating structural data of a structure comprising:

a scanning laser range finder which provides up to 125,000 discrete data points every second that produces reflectance data of the structure;

a memory which stores the reflectance data; and

means for determining desired spatial relationships of the structure from the reflectance data.

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Claim 2 (original): An apparatus as described in Claim 1 wherein the determining means includes interface means for allowing desired spatial relationships to be chosen.

Claim 3 (original): An apparatus as described in Claim 2 wherein the data includes a reflectance image and a point cloud of the structure that are produced simultaneously by the laser range finder.

Claim 4 (original): An apparatus as described in Claim 4 wherein the reflectance image is provided to the interface means which allows a user to work with the reflectance image that is a 2D representation of the point cloud which is a 3D representation of the structure.

Claim 5 (original): An apparatus described in Claim 4 wherein the data includes distance measurements and reflectance measurements of the structure that have a direct correspondence.

Claim 6 (original): An apparatus as described in Claim 5 wherein the reflectance image is formed from reflectance measurements and range data.

Claims 7-13 (canceled)

Claim 14 (currently amended): A method for generating structural data of a structure comprising the steps of:

loading a reflectance image into an image window;

selecting a first point of the structure in the image;

selecting a second point on the structure;

~~selecting~~ selecting a third point of the structure;

measuring edges with respect to the first point, second point and third point;

extracting straight edges for the first point, second point and third point;

constructing a plane so as to be perpendicular to an average of directions of
lines defined by the straight edges edges' lines;

intersecting the plane in turn with each of the lines to determine three control
points; and

computing dimensions for appropriate pairs with the three control points for
measuring distances between discrete points on the structure.

Claim 15 (currently amended): A method as described in Claim 14 wherein the
constructing step includes the step of constructing a plane so as to be perpendicular to a
weighted average of directions of the lines of the straight edges edges' lines.

Claim 16 (previously presented): A method as described in Claim 15 including the step of generating queries into a data set of the reflectance image.

Claim 17 (currently amended): A method as described in Claim 16 wherein the selecting a first point step includes the step of selecting the first point on an exterior face near a first edge of the structure in the image ~~as represented by a first pixel in the image~~.

Claim 18 (previously presented): A method as described in Claim 17 wherein the generating queries step includes the step of generating queries into the data set of the reflectance image by interacting with a set of icons and windowing commands.

Claim 19 (previously presented): A method as described in Claim 18 wherein the extracting step includes the step of checking that the straight edges are essentially parallel.

Claim 20 (previously presented): A method as described in Claim 19 wherein the selecting the second point step includes the step of selecting the second point on the face near the second edge of opposite the first edge.

Claim 21 (previously presented): A method as described in Claim 20 wherein the selecting a second point includes the step of selecting a second point at a same longitudinal position as the first point.

Claim 22 (previously presented): A method as described in Claim 21 wherein the selecting the third point includes the step of selecting the third point on the structure on an opposite side of the exterior face of the structure near a third edge in the interior of the structure.